

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(Chapter II of the PCT)

Applicant's or agent's file reference 2271/80 WO	FURTHER ACTION see Form PCT/IPEA/416	
International Application No. PCT/EP2004/001250	International filing date (<i>day/month/year</i>) 11.02.2004	Priority date (<i>day/month/year</i>) 18.03.2003
International Patent Classification (IPC) or national classification and IPC B60J10/04		
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1.	This report is the international preliminary examination report which has been prepared by the authority charged with the international preliminary examination and is transmitted to the applicant according to Article 36.
2.	This REPORT consists of a total of 5 sheets, including this cover sheet.
3.	<p>The report is also accompanied by ANNEXES; these comprise</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of 9 sheets; these are</p> <p style="margin-left: 20px;"><input type="checkbox"/> sheets with the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications to which the authority has agreed (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 20px;"><input type="checkbox"/> sheets which replace earlier sheets but which for the reasons set out in field No. 1, point 4 and in the additional field in the opinion of the authority contain an amendment which goes beyond the content of disclosure of the international application in the version as originally filed.</p> <p>b. <input type="checkbox"/> (<i>sent only to the International Bureau</i>) i> in total (please specify type and number of electronic data carrier(s) containing a sequence listing and/or the appertaining tables, only in computer-readable form, as specified in the additional field concerning the sequence listing (see Section 802 of the Administrative Instructions).</p>
4.	<p>This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Field No. I Basis of the report <input type="checkbox"/> Field No. II Priority <input type="checkbox"/> Field No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Field No. IV Lack of unity of invention <input checked="" type="checkbox"/> Field No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Field No. VI Specific documents cited <input type="checkbox"/> Field No. VII Specific defects in the international application <input type="checkbox"/> Field No. VIII Specific observations on the international application

Date of filing of the request 21.07.2004	Date of completion of this report 22.12.2004
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Netherlands Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorised officer Verkerk, E Tel. +31 70 340-4344

INTERNATIONAL PRELIMINARY REPORT
CONCERNING PATENTABILITYInternational Application
PCT/EP2004/001250

Field No. I Basis of the report

JC20 Rec'd PCT/PTO 30 JUN 2005

1. With regard to the **language**, the report is based on the international application in the language in which it was filed, unless otherwise indicated under this point.

- ☐ The report is based on a translation out of the original language into the following language, which is the language of the translation which has been filed for the following purpose:
- ☐ international search (under Rules 12.3 and 23.1(b)).
 - ☐ publication of the international application (under Rule 12.4).
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3).

2. With regard to the **elements** of the international application the report is based on (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report*):

Description, pages:

5-9 as originally filed
1-4, 4a, 4b filed on 21.07.2004 with the letter of 20.07.2004

Claims, No.:

1-10 filed on 21.07.2004 with the letter of 20.07.2004

Drawings, sheets

1/3-3/3 as originally filed

- ☐ a sequence listing and/or any appertaining tables - see additional field concerning the sequence listing

3. The amendments have resulted in the cancellation of the following documents:

- ☐ description: pages
- ☐ claims: No.
- ☐ drawings: sheets/Fig.
- ☐ sequence listing (*precise details*)
- ☐ any tables appertaining to the sequence listing (*precise details*):

4. ☐ This report has been established without taking account of (some of) the amendments appended to this report and listed below, since for the reasons set out in the additional field in the opinion of the authority they go beyond the content of disclosure in the version as originally filed (Rule 70.2(c)).

- ☐ description: pages
- ☐ claims: No.
- ☐ drawings: sheets/Fig.
- ☐ sequence listing (*precise details*)
- ☐ any tables appertaining to the sequence listing (*precise details*):

* If point 4 applies, some or all of these sheets can be marked "replaced".

Field No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-10
	No: Claims
Inventive step (IS)	Yes: Claims 1-10
	No: Claims
Industrial applicability (IA)	Yes: Claims 1-10
	No: Claims

2. Citations and explanations (Rule 70.7):
see separate sheet

With regard to point V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following document:

D1: WO 00/03885 A (BAEDJE K H METEOR GUMMIWERKE; BUCHHOLZ HANS
VOLKER (DE)) 17 January 2000 (2000-01-27)

2. The document D1 is regarded as the closest prior art in relation to the subject matter of Claim 1. It discloses - see Figures 4, 5 and 6, and page 6, line 29, to page 7, line 14 (the references in brackets relate to this document):

A sealing strip (14) which is arranged for mounting on a frame structure (36, 37) of a vehicle and is intended for co-operation with a window pane (44) which is pivotable between an open position and a closed position, with at least one sealing lip (42, 43) which butts at the edge against the pane (44) as a function of the pivoted position of the pane, wherein shaped parts (18, 21) which are produced separately from one another, are intended for mounting on the frame structure (36, 37) and bear at least one sealing lip and which in the mounted state form a space which is generally U-shaped in cross-section and is arranged to receive the pane (44).

Therefore the subject matter of Claim 1 is distinguished from the sealing strip in that

at least one of the two shaped parts is adjustably fixed on the frame structure in a direction perpendicular to the surface of the pane, wherein the shaped parts in the mounted state are connected only via the frame structure, but are not connected directly to one another.

Therefore the subject matter of Claim 1 is novel (Article 33(2) PCT).

2.2 Thus the object to be achieved by the present invention may be seen in the fact that the contact pressure of the at least one sealing lip is adjustable.

The means for achieving this object proposed in Claim 1 of the present application is based on an inventive step (Article 33(3) PCT) for the following reasons:

The construction of a sealing strip in such a way that possibilities for adjustment of the contact pressure of the sealing lips on the pane to be received is not disclosed by the prior art, nor is it rendered obvious thereby.

3. Claims 2-10 are dependent upon Claim 1 and therefore likewise satisfy the requirements of the PCT with regard to novelty and inventive step.
4. The subject matter of the claims relates to a sealing strip and is commercially applicable for example in vehicles.

DescriptionSealing strip for the frame structure of a vehicle

The invention relates to a sealing strip according to the preamble to Claim 1.

Such sealing strips are intended to co-operate with the movable pane of the window opening of a vehicle, which pane can move between an open and a closed position. They are used in the region of the C-columns, but also the roof frame of folding roof covers, hardtops and retractable hardtops. The sealing elements come more or less into sealing abutment with the edge regions of the pane depending upon the state of opening of the pane.

As a rule the sealing elements are constructed in such a way that sealing lips are provided on both sides of the pane and butt with a defined prestressing against the pane. This prestressing is designed so that sufficient sealing force is provided but the unavoidable wear is kept within limits.

In the design of the pivoting movement of the pane between the open and the closed position, limiting conditions must be heeded which are contingent upon the configuration of the space available within the door construction. This is often restricted by the wheel cases, so that simple vertical movement of the pane is frequently impossible and a pivoting movement therefore must be arranged which is adapted to these spatial restrictions. This situation must also be taken into account in the design of the sealing strip, namely with the object of ensuring that the sealing lips uniformly cover the pane on both sides as a function of the state of opening of the pane along the pivot curve which is fixed by the design.

A further limiting condition for the sealing strip results from the spatial curvature of the window boundary defined by the respective vehicle.

In the applicants' firm integral sealing strips are known which exhibit a generally U-shaped construction in cross-section and can be fixed on the frame structure of a vehicle, in this case

a window enclosure, by way of a central base section. These sealing strips arrive at the vehicle assembly line in this form, that is to say as a finished product. Because of the aforementioned pivot curve which has to be arranged for the pane, this space - when viewed along the sealing strip - has different depth dimensions so that because of the poor accessibility it is frequently very difficult to carry out subsequent work on functional surfaces which are usually disposed within this space. In individual cases this can lead to reductions in quality and even to defects in the end products.

From the located document WO 00/03885 A a sealing strip is known which is arranged for mounting on a frame structure of a vehicle, is intended for co-operation with a pivotable pane of a window and forms a space which is generally U-shaped and arranged to receive the pane. The free ends of the cross-sectional structure are each provided with a sealing lip which is intended for sealing abutment on the edge. The said cross-sectional structure is composed of two L-shaped parts, the base parts of which overlap and the side parts of which form the lateral boundaries of the cross-section. The base parts are fixed relative to one another by positive locking, and at the same time are firmly fixed to the frame structure of the vehicle by screwing.

From the located document FR 2 743 028 A a comparable sealing strip is known which has a U-shaped cross-section and is generally composed of two L-shaped frame parts which are made from thermoplastic plastics material and jointly bear a sealing element which on its free ends forms sealing lips which are intended for lateral abutment on the pane of the doors of a motor vehicle. By way of a central intermediate portion in the form of a membrane the sealing element connects the base portions of the frame parts, wherein this intermediate portion is dimensioned in such a way that the frame parts are spaced from one another in the unmounted state of the sealing strip. However, the installed state of this sealing strip is characterised in that the two frame parts are firmly connected to one another by way of their base portions which are of complementary construction in the manner of a tongue-and-groove joint, so that the membrane-like connecting portion arches into the interior of the U-shaped cross-section and forms a resilient abutment strip for a pane introduced into this space.

The sealing strip which is known from the located document DE 195 31 600 A1 is characterised by an integral U-shaped rail, the free ends of which are connected to sealing lips which protrude into the U-shaped cross-sectional space and are intended for sealing abutment on the pane of the doors of a motor vehicle. The said rail is fixed by screwing of one of the two flanks to a flange-like frame structure of the vehicle, the screw connection being designed in such a way that adjustment in the vertical and longitudinal direction of the vehicle is possible.

All of these known sealing strips are characterised in that the dimensions of the U-shaped receiving structure for the pane are in fact predetermined by the design and are not adjustable. This means that accordingly the contact pressure of the sealing elements or of the sealing lips is likewise determined by the dimensions, the shape and the material. In the case of these designs, if the resulting contact force is inadequate or irregular there are no corrective measures available which can be carried out simply in terms of cost.

One requirement for variation of the contact pressure results from the predicted future use of vehicle wash installations in which brush arrangements which move in a rotary or linear fashion are omitted and instead of these systems nozzle arrangements are used from which a cleaning fluid emerges under high pressure. In individual cases sealing arrangements in the window region have proved unsatisfactory in order to withstand the pressure of the impacting cleaning fluid.

The object of the invention is to design a sealing strip of the generic type described above with a view to a qualitatively uniform and reproducibly good end product and also with a view to subsequent changes to the setting. This object is achieved in such a sealing strip by the features of the characterising portion of Claim 1.

First of all it is essential to the invention that the two shaped parts which surround the space of U-shaped cross-section in the sealing strip are in the form of components which are separate from one another and thus arrive at the vehicle assembly line in this separated state. Thus operations which occur after the shaping of the shaped parts can be carried out

unhindered by the shape of the sealing strip, so that the production problems which are associated with the restricted accessibility of working surfaces within the said space and its changing depth - when viewed along the sealing strip - do not even occur at all. Thus both shaped parts can be processed separately from one another until the end product stage is reached. This opens up advantageous possibilities for the provision of a reproducible product quality.

It is also an essential feature of the invention that at least one of the two shaped parts - when viewed in a direction perpendicular to the surface of the pane - is adjustably fixed on the frame structure or a window enclosure. This means that the contact pressure with which the sealing lips are applied to the pane can be varied by adaptation of the position of at least one of the shaped parts. In this way an irregular contact pressure, irrespective of its cause, on both sides of the pane can be changed or compensated for in a desired manner. Furthermore, in so far as this can be combined with a limitation of the wear and also in circumstances in which it is difficult to operate the opening and closing process of the pane an increased contact pressure can be set so that problems with high-pressure car wash installations are reliably avoided.

According to the features of Claim 2, processing of functional surfaces, e.g. sealing surfaces, can comprise the application of coatings for example in the form of antifriction varnish, fibre coverings, etc.

According to the features of Claim 3 the sealing strip has a spatially curved configuration, wherein the depth dimension of the space with a U-shaped cross-section changes from one end to the other. The spatial curvature as well as the type of change of the said depth dimension are determined by the design data of the respective vehicle.

The features of Claim 4 are directed to one example of an embodiment of the sealing strip which is simple to implement. At least the shaped part which is disposed so as to be adjustable perpendicular to the pane has an L-shaped cross-section and comprises a base part and a side part, wherein the former is arranged for fixing on the frame structure. The shaped

4a

parts are mounted independently of one another on the frame structure and are not directly connected to one another in any case.

The features of Claims 5 to 8 are directed to a further embodiment of the sealing strip in terms of design and materials. Accordingly it is connected to the frame structure with the proviso that the space delimited by the sealing strip is in any case reliably sealed and protected relative to the outer space. Accordingly the shaped parts can be made from a plastics material, a metal, e.g. high-alloy steel sheet, or in one case from plastics material and in the other case from a metal. Depending upon the dimensions and the structure of the shaped parts an improvement in stability may be expected in the case where the part is made from plastics material over an arrangement of reinforcing ribs.

Due to the releasable fixing of the shaped parts on the frame structure according to Claim 9 subsequent interventions are also possible, in particular readjustments of the sealing lips.

According to the features of Claim 10 the shaped parts are constructed so that they are spatially curved in a manner which is dependent upon the respective vehicle.

New Claims

1. Sealing strip which is arranged for mounting on a frame structure (3) of a vehicle and is intended for co-operation with a window pane (17) which is pivotable between an open position and a closed position, with at least one sealing lip (12, 16) which butts at the edge against the pane (17) as a function of the pivoted position of the pane, comprising shaped parts (1, 2) which are produced separately from one another, are intended for mounting on the frame structure (3) and bear at least one sealing lip and which in the mounted state form a space (4) which is generally U-shaped in cross-section and is arranged to receive the pane (17), characterised in that the shaped parts (1, 2) in the mounted state are connected only via the frame structure (3), but are not connected directly to one another, and that at least one of the two shaped parts (1, 2) is adjustably fixed on the frame structure (3) in a direction (21) perpendicular to the surface of the pane (17) in such a way that the contact pressure of the at least one sealing lip (12, 16) is adjustable.
2. Sealing strip as claimed in Claim 1, characterised in that at least one of the shaped parts (1, 2) is provided with a functional surface which is to be coated or to be processed in some other way.
3. Sealing strip as claimed in Claim 1 or 2, characterised in that the space (4) has a changing depth dimension (7) in adaptation to the movement curve of the pane (17) between a completely open position and a completely closed position starting from one end (8) thereof up to the other end (9) thereof.
4. Sealing strip as claimed in any one of Claims 1 to 3, characterised in that at least one of the two shaped parts (1, 2) has a generally L-shaped configuration and comprises a base part (13) intended for fixing on the frame structure (3) and a side part (14) extending perpendicular thereto, wherein the side part (14) extends substantially parallel to the pane (17) or to the depth dimension (7).

5. Sealing strip as claimed in Claim 4, characterised in that the base part (13) extends substantially parallel to an edge portion (6) of the frame structure (3) and is adjustably connected to the edge portion (6) perpendicular to the surface of the pane (17) in the direction of the arrows (21).
6. Sealing strip as claimed in any one of Claims 4 or 5, characterised by at least one sealing profile (26, 22) which is effective between the frame structure (3) and one of the shaped parts (1, 2) for sealing the interior of the sealing strip relative to the outer face (24) of the frame structure (3).
7. Sealing strip as claimed in any one of the preceding Claims 1 to 6, characterised in that the shaped parts (1, 2) are made from a plastics material, e.g. PPE, that the sealing elements (11, 15) as well as the at least one sealing profile (26, 22) are made from an elastomer, e.g. EPDM or TPE, and are in each case constructed as shaped elements which are connected to the shaped parts (1, 2) within the framework of a moulding process or in some other way.
8. Sealing strip as claimed in any one of the preceding Claims 1 to 6, characterised in that at least one of the shaped parts (1, 2) is made from a metal material, e.g. high-alloy steel sheet, that the sealing elements (11, 15) as well as the at least one sealing profile (26, 22) are made from an elastomer, e.g. EPDM or TPE, and are in each case constructed as shaped elements which are connected to the shaped parts (1, 2) within the framework of a moulding process or in some other way.
9. Sealing strip as claimed in any one of the preceding Claims 1 to 8, characterised in that the shaped parts (1, 2) are releasably connected to the frame structure (3).
10. Sealing strip as claimed in any one of the preceding Claims 1 to 9, characterised in that the shaped parts (1, 2) have a spatially curved configuration starting from one end (8) to the other end (9) as a function of the frame structure (3).